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ABSTRACT

A study was conducted to determine (1) if teachers treated differing ability reading groups within their classes differently, (2) if teacher behaviors affected mean group achievement, and (3) if so, if that effect was similar for both high and low achieving reading groups. The study involved 14 classes, 39 reading groups, and 277 students. The number of reading groups in each class varied from two to four, and the number of students in each reading group varied from four to thirteen. Classroom observers recorded academic interactions between teacher and student that were initiated by the teacher. The results showed that teachers used more nonvolunteer selection, preselection, and volunteer selection in lower ability reading groups than in higher ability groups. In addition, even though students in lower ability groups were reading on a lower level and answering more questions incorrectly than their peers in higher achieving groups, teachers praised them more often. Overall, teachers appeared to accommodate their behavior to the ability level of the reading group; however no significant relationship was found between teacher behaviors and student achievement. (FL)

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Teachers' Interactions with Reading Groups of Differing Ability Levels

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Teachers' Interactions with Reading Groups of Differing Ability Levels

In the early grades, reading instruction and practice are usually provided in small ability-based groups (Austin & Morrison, 1963). The theory behind such homogeneous grouping is that teachers will be able to provide more individualized instruction if the range in ability level is restricted. That is, students who are reading on a higher level will need more difficult material and different kinds of instruction than students who are reading on a lower level. By grouping students, teachers can better meet the different needs of all their students.

Given then, that reading is primarily taught in ability-based reading groups and that reading is one of the most important basic skills, the functioning of reading groups within the classroom is an important area for research. However, few researchers have attempted to study, by direct observation, processes occurring during reading group instruction. Weinstein (1976) studied the formation of reading groups, their stability across the school year, and student-teacher interactions occurring within the groups. She found that after the first month of school, reading group membership tended to stabilize, particularly for high and low ability-based reading groups. Although Weinstein had a very small sample (three classes each containing three reading groups) she also found different patterns of student-teacher interactions for high, middle, and low achieving reading groups. Other research, particularly teacher expectations research, has shown that teachers tend to respond differently to high and low achieving students. Brophy and Good (1970) found that teachers treated students they designated as high

and low achievers differently, even when there was very little actual difference in achievement among students.

Consequently, it seems reasonable to expect teachers to respond differently to their low and high achieving reading groups. This is the first question which will be addressed in the current study.

Two related questions concern whether the teacher's behaviors have an effect on group mean achievement and if so, is that effect similar for both high and low achieving reading groups. In other words, is it necessary for the teacher to treat these groups differently in order to maximize achievement gains? Conceivably, teacher behaviors such as praise may be ineffectual in promoting the achievement of high ability reading groups but may be very effective in promoting the achievement of low ability groups.

The present study further analyzes data that were collected in the First-grade Reading Group Study (Anderson, Evertson & Brophy, 1979). Data were collected on teacher's interactions with individual students while those students participated in reading groups within intact classrooms. Reading group means were the unit of analysis and these group means were analyzed within classes. Analyzing within classes avoids the problem of nonindependence that would arise if group means were pooled across classes (see Glendening and Porter, Note 1). Three questions will be addressed:

1. Do teachers treat differing ability reading groups within their class differently?

2. Do teacher behaviors affect mean group achievement? and

3. If teacher behaviors do affect mean achievement, is that effect similar for both high and low achieving reading groups?

Method

Overview

The First-grade Reading Group Study was an experimental study that tested the effectiveness of a model containing 22 principles of small group instruction. Ten treatment teachers agreed to apply the model when teaching their reading groups. Ten control teachers were not given the instructional principles. All 20 teachers were observed teaching reading groups throughout the year.

The Metropolitan Readiness Test was given at the beginning of the school year. A Total Readiness score was computed from six subscale scores and was used in all analyses as the pretest measure. The reading subtests of the Metropolitan Achievement Test, Level I, were given at the end of the year. Two subtests were used to create a Total Reading score, which was the post-test measure of student achievement in all analyses reported here.

Classroom observations were recorded with a low-inference coding system developed specifically for the study. Only data describing academic interactions with individual students, initiated by the teacher during reading group instruction, are reported in this paper.

The methodology and results of the study are completely described in Anderson, Evertson, and Brophy (Note 2).

Subjects

Data were collected on 20 teachers in six middle-SES schools serving a predominantly white population in an urban district in the Southwest. The original sample of 20 teachers was reduced in order to obtain a consistent set of data for the analyses presented in this paper. It was necessary to have a data set that contained observation

scores recorded for students while they participated in single reading groups within single intact classrooms throughout the year. However, there was student mobility between groups, some students had incomplete data, and some teachers formed new groups that existed for only a few observations. Hence, the results presented in this investigation are based on a subset of the original sample. Students with incomplete test data were not considered. Reading groups that were observed less than six times or contained less than four students were eliminated from analysis.

Most teachers indicated that they formed their reading groups on the basis of the Metropolitan Reading Readiness scores, so that students within readings groups were relatively homogeneous with respect to ability level. However, because teachers formed reading groups on the basis of ability, reading groups within a class were heterogeneous with respect to ability level--there was generally a high, a middle, and a low ability group in each class. Classes which contained only low or high reading groups (due to team teaching) or classes with less than three reading groups were dropped from the study. The end result was a set of data in which every student participated in a single reading group within a single classroom for the five months of the observation.

The original data set consisted of 20 classes, 67 reading groups, and 540 students. This final data set consisted of 14 classes, 39 reading groups, and 277 students. Of the 14 classes, eight were treatment classes and six were control classes. The number of reading groups in each class varied from two to four with a mean of 2.7 groups per class. The number of students in each reading group varied from four to 13 with a mean of seven students per group. Average pretest

scores on the Metropolitan Reading Readiness Test for the reading groups ranged from 38 to 96 with a mean of 66 and a standard deviation of 14.

Data Collection

Four observers were trained to use the observational coding system. Every observer coded with every other observer until 80% agreement was reached on each major section of the coding system. After this time, observers worked alone. Each of the 20 teachers was seen by two observers who alternated visits to classrooms, beginning in November and continuing about once a week through April, so that each class was observed 15 to 20 times during the year.

Dependent Variables

The behavioral variables reported here were chosen because they represented the four major components of an academic interaction between the teacher and an individual student: selection of student, questioning by the teacher, the student's answer, and the teacher's response to the answer.

These behavioral variables, with the exception of one rate variable (total response opportunities per minute), were expressed as proportions. To create these proportions, occurrences of each behavior were totaled for all observations. These total occurrences for each behavior were then compared to the maximum possible occurrences of the behavior. For example, the number of correct answers was compared to the total number of answers to give the proportion of all answers that were correct. These proportion variables are listed in Table 1 and again in Table 2.

Several additional group level variables were investigated in this study. One set of variables involved the average amount of response

opportunity time in each of the following contexts: slow-paced questioning and answering without individual materials; activities involving workbook or worksheet; fast-paced drill; reading of new material from the basal textbooks; and rereading of material already covered in the basal textbooks. A second set of variables concerned ratings of reading groups completed by observers at the end of the school year. These ratings included: general level of group attention; level of reading group demands; enthusiasm of students; teacher determination to follow through when necessary; teacher enjoyment of reading group; and average length of reading turn. Finally, reading group level attained at the end of the school year and average reading group size were investigated.

Data Analyses

The first set of analyses was designed to determine whether teachers responded to the various reading groups within their classes differently. To investigate this question, two regression models were evaluated for each of the variables described above. In each model, reading group means were the unit of analysis and binary vectors denoting class membership were included so that, in effect, reading group means were analyzed within classes. The models are presented below:

1. $VAR = PRE + C_1 + \ldots + C_{15} + E$
2. $VAR = C_1 + \ldots + C_{15} + E$

where:

VAR = group mean on the dependent variable;

PRE = group mean on the reading readiness test

$C_1 + . . . + C_{15}$ = binary vectors denoting class membership; and

E = error vector.

The $\underline{R}^2$ for Model 1 was compared to the $\underline{R}^2$ for Model 2. A significant drop in $\underline{R}^2$ indicated that the group mean on the pretest was contributing significantly to the prediction of the behavior. In other words, within classes, the teacher was responding to higher achieving reading groups differently from lower achieving groups. These two model comparisons were repeated for each of the 38 variables.

Only the behavioral variables were used in the second set of analyses. These analyses were designed to determine: 1) whether the group mean on the behavioral variable was related to group mean achievement, and 2) whether the effect of the behavior on achievement depended on the ability level of the reading group. Three regression models were evaluated for each of the 25 behavior variables. In all models the unit of analysis was reading groups. Binary vectors denoting class membership were included so that, in effect, reading group means were analyzed within classes. The models are shown below in abbreviated notation:

3. $ACH = PRE + BH + PRE*BH + C_1 + . . . + C_{15} + E$

4. $ACH = PRE + BH + C_1 + . . . + C_{15} + E$

5. $ACH = PRE + C_1 + . . . + C_{15} + E$

where:

ACH = reading group mean on achievement;

PRE = reading group mean on reading readiness;

BH = reading group mean on the behavior variable;

PRE*BH = interaction of group mean on reading readiness with group mean on the behavior variable;

$C_1 + \ldots + C_{15}$ = binary vectors denoting class membership; and

E = error vector

$\underline{R}^2$ was computed for the full model (Model 3) and compared to $\underline{R}^2$ for the model without the interaction of pretest and behavior variable (Model 4). A significant drop in $\underline{R}^2$ indicated that the behavior variable had different effects on achievement depending on the average pretest level of the reading group.

$\underline{R}^2$ for Model 4 was compared with $\underline{R}^2$ for Model 5 in which the behavior variable had been deleted. A significant drop in $\underline{R}^2$ indicated that the behavior term was significantly adding to the prediction of achievement, i.e., the behavior was related to group mean achievement.

Results

Results from the first set of analyses are presented in Table 1. In these analyses, the various behavioral, rating, and time measures were predicted within classes by mean reading group pretest scores. Thus, it was possible to determine whether reading groups with higher pretest scores within a class were seen as differing on these measures from reading groups with lower pretest scores.

Of the 25 classroom behaviors, seven were significantly related to pretest scores. Higher achieving reading groups within a class received more ordered selections and fewer preselections, nonvolunteer selections, and volunteer selections than lower achieving reading groups.

Ordered selection may be a method teachers use to control overeager students in higher achieving reading groups. Many of these students are probably capable of answering the teachers' questions and the teacher may thus use ordered selections to ensure that all students get a chance to respond. A different situation may exist in lower achieving reading groups. In these groups, students are less likely to know the correct answer and hence, the teacher may resort to calling on volunteers when possible. Also nonvolunteer selection and preselection may be methods the teacher can use to ensure that students are attending to the lesson and participating -- both problems that are more likely to occur in lower achieving reading groups.

As would be expected, higher achieving reading groups answered more questions correctly and lower achieving reading groups answered fewer questions correctly.

Finally, lower achieving reading groups received more praise than higher achieving reading groups within the same class. This finding agrees with that of Brophy and Good (1974) who also found that teachers tended to praise lower achieving students more than higher achieving students. Perhaps, teachers praise lower achieving reading groups more than higher achieving groups to try to encourage the lower achievers.

The absence of significant relationships for the remaining feedback variables is important as it suggests that teachers treat reading groups similarly with respect to feedback to incorrect answers. That is, there is no evidence to indicate that teachers provide more (or less) criticism, terminating feedback (providing the student with the correct answer), or sustaining feedback (repeating the question, allowing more

time, or giving clues to simplify the question) to incorrect answers for lower achieving reading groups than higher achieving groups.

Results from the response opportunity time analyses indicated that higher level reading groups spent more time reading new material than lower level reading groups. This makes sense as higher level groups probably grasp material faster and are able to move to new material more rapidly than lower achieving groups. Higher achieving reading groups also had more total response opportunity time than lower achieving groups. This is a rather surprising finding as it indicates that teachers are spending less time with their lower achieving groups although these are the groups that most need additional help and practice with reading skills. This might be explicable if the lower achieving groups were smaller, therefore decreasing the amount of time needed to give all students an opportunity to participate. However, group size was not related to ability level.

The observer ratings of reading groups yielded three significant relationships with average group ability. Level of group attention was positively related to ability level, indicating that higher ability groups were more attentive than lower ability groups. This is probably reasonable as students in higher ability groups are generally more mature and able to focus on activities for a longer period of time than students in lower ability groups. Level of reading group demand was positively related to ability level, indicating that the higher ability groups were reading more difficult material and were required to do more difficult tasks than lower ability groups. Finally, length of reading turn was positively related to ability level, indicating that higher ability groups had longer reading turns. Apparently, the teacher is not

only spending more time with higher ability groups, but is also allowing students in these groups to read for longer periods of time. It is interesting to note that observers did not think that teachers enjoyed their high ability groups more than their low ability groups and also perceived no difference in enthusiasm of students.

Results from the second set of analyses are presented in Table 2. These analyses examined differences between reading groups within classes to determine if differential teacher treatment of the groups was related to different adjusted achievement. There were only four significant main effects, i.e., group means on the teacher behavior that were significantly related to adjusted achievement. Nonvolunteer selection was negatively related to adjusted achievement, that is, groups in which the teacher selected students more often by calling on nonvolunteers in a random fashion had lower achievement. This variable may represent something about the eagerness of group members to participate, or the attention level of students in the group. Teachers often use this selection technique when students do not volunteer, when there is no consistent pattern for calling on students equally, or when they need to bring a student back to attention. If these conditions existed in one group more than another within a class, and if they led to higher rates of nonvolunteer selection, then it is reasonable that the variable would be associated with lower achievement.

Three other main effects were found: Higher achievement was related to 1) higher proportions of correct answers, 2) fewer failures to respond, and 3) lower rates of giving the answer to a student after he failed to respond. There was one significant interaction with entering ability for the use of a clue (usually through simpler

questions) following incorrect answers. Within a class, reading groups with higher achievement tended to perform better when provided with a clue following an incorrect response than reading groups with lower achievement. Perhaps higher achieving students are better able to reason out the correct answer, as they are generally more skilled academically than lower achieving students. If this is true, then one would expect similar results for reading groups composed of higher achieving students than those composed of lower achieving students.

In summary, these results suggest that reading groups within a class in which more students had higher proportions of successful interactions, and in which the teacher showed a greater tendency to sustain interactions, had greater achievement.

Conclusions

One of the first tasks for any teacher in the classroom is to attain student cooperation. As Doyle (1979; Note 3) has stated:

> If a large number of students do not cooperate in the activity, the public evidence is available to all students present that the teacher lacks classroom management skills, a condition that has serious consequences for cooperation in the future...if cooperation is not achieved misbehavior increases and cooperation can be lost completely. (p. 31)

Doyle continues by claiming that one way to reduce the demands of achieving cooperation is to "adjust both task demand and activities to accommodate to the ability level and inclination to cooperate that characterize a particular classroom group" (p. 31).

The results obtained in this study provide some support for this notion that one of the teachers' primary goals to is attain student cooperation and that this goal may be accomplished by adjusting task demands. As mentioned previously, teachers used more nonvolunteer

selection, preselection, and volunteer selection in lower ability reading groups than in higher ability groups. Greater use of volunteer selection suggests that teachers may be trying to provide successful learning experiences for these students; it is unlikely that students will volunteer to answer a question if they are not fairly confident that they know the correct answer. Also, as mentioned previously, nonvolunteer selection and preselection may be techniques teachers use to draw inattentive students back to the lesson and/or ensure that all students participate.

The use of these types of selection techniques, combined with the fact that observers rated lower achieving reading groups as having lower attention levels, suggests that getting and keeping student attention may be one of the main problems that teachers face when dealing with lower ability reading groups. In light of this interpretation, the shorter reading group sessions for the lower ability groups appear more reasonable; by keeping sessions short, the teacher has a better chance of keeping students engaged in the activity.

Although students in lower ability reading groups were reading on a lower level and answering more questions incorrectly than their peers in higher achieving reading groups, teachers praised the lower achieving students more. The greater use of praise could be interpreted as an attempt by teachers to encourage cooperation and continued responding from these lower achieving students. It is also interesting to note that even with their greater number of mistakes, teachers were not more likely to criticize lows or provide them with terminal feedback when they responded incorrectly than students in higher achieving groups.

Observers also rated lower achieving groups as having easier tasks and shorter reading turns than higher achieving reading groups.

Apparently, teachers were accommodating their behavior in many ways to the ability level of the reading group. Such differential behavior appears to be due to attempts to encourage lower achieving groups and elicit their cooperation. Without student cooperation it is obvious that teachers' attempts to teach would be futile.

Only four of the 25 behavior variables were related to mean achievement. This may be due to the small variance for reading group means on the behavior variables within classes. In other words, as indicated above, teachers tended to treat reading groups within a class similarly with respect to most behaviors and this reduced the likelihood of detecting a relationship between behaviors and achievement even if such a relationship did exist.

Similarly, the lack of interactions between pretest and behavior may have been due to the small variance within classes on the behaviors. Even if there are behaviors that are more effective for highs than lows and vice versa, it may not be possible to detect these interactions by looking at reading groups within classes, because what is considered a high group in one class may be a low group in another. Consequently, interactions between pretest and behavior may be obscured if the interactions are due to absolute pretest levels and not relative pretest levels within classes.

Reference Notes

1. Glendening, L., & Porter, A. The effects of correlated units of of analysis: Violating the assumption of independence. Measurement and Methodology Program, National Institute of Education, 1974.

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3. Doyle, W. The tasks of teaching and learning in classrooms (R&D Rep. No. 4103). Austin, Texas: Research and Development Center for Teacher Education, The University of Texas at Austin, 1979.

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Anderson, L., Evertson, C., & Brophy, J. An experimental study of effective teaching in first-grade reading groups. Elementary School Journal, 1979, 79, 193-223.

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Table 1

Prediction of Group Criterion Variables

with Average Group Reading Readiness Scores

Criterion Variable	Mean[1]	SD	Differences in R^2	p	Beta[2]
Behavioral Variables					
1. Total Response opportunities per minute	.31	.12	.0004	ns	-.0288
2. Teacher selection of students based on ordered turns	.53	.07	.0182	<.001	.1854
3. Teacher selection of students prior to asking a question	.09	.02	.0113	<.01	-.1459
4. Teacher selection of nonvolunteers	.18	.03	.0117	.02	-.1484
5. Teacher selection of volunteers	.14	.03	.0106	.03	-.1419
6. Student call outs in response to a teacher question	.06	.02	.0083	ns	-.1254
7. Response opportunities that were reading questions	.68	.06	.0047	ns	-.0943
8. Response opportunities that were nonreading questions	.30	.06	.0044	ns	.0911
9. Response opportunities with correct answers	.72	.06	.0751	.03	.3764
10. Response opportunities with incorrect answers	.21	.05	.1558	<.01	-.5424
11. Response opportunities with don't know answers	.01	.01	.0000	ns	-.0065

Table 1-continued

Criterion Variable	Mean[1]	SD	Differences in R^2	p	Beta[2]
Behavioral Variables					
12. Response opportunities with no response answers	.12	.03	.0014	ns	-.0514
13. Correct answers with no feedback	.08	.04	.0137	ns	.1609
14. Correct answers with emphasis feedback	.36	.07	.0013	ns	-.0502
15. Correct answers with praise feedback	.10	.05	.1708	.001	-.5680
16. Correct answers with new question feedback	.19	.06	.0097	ns	.1350
17. Incorrect answers with criticism feedback	.02	.02	.0003	ns	.0217
18. Incorrect answers with terminating feedback	.50	.06	.0004	ns	-.0278
19. Total incorrect answers with sustaining feedback	.46	.06	.0059	ns	.1050
20. Incorrect answers with give answer feedback	.35	.14	.0004	ns	-.0287
21. Incorrect answers with clue feedback	.24	.12	.0006	ns	.0343
22. No response answers with give answer feedback	.33	.18	.0011	ns	-.0448
23. No response answers with clue feedback	.30	.15	.0156	ns	.1712
24. Total incorrect answers with improvement	.34	.12	.0076	ns	.1202

Table 1-continued

Criterion Variable	Mean[1]	SD	Differences in R^2	p	Beta[2]
Behavioral Variables					
25. Total no response answers with improvement	.33	.15	.0174	ns	.1814
26. Total response opportunity time	24.87	5.17	.0518	.03	.3142
Response Opportunity Time					
27. Slow-paced question- and answering without individual materials	6.28	4.79	.0025	ns	.0686
28. Workbook or worksheet activities	7.73	4.92	.0033	ns	-.0793
29. Fast-paced drill	.73	1.02	.0242	ns	-.2150
30. Reading of new material	9.11	3.53	.1133	.01	.4651
31. Rereading of material already covered	1.12	1.64	.0062	ns	.1090
Observer Ratings of Groups					
32. Level of group attention	2.56	.81	.1079	.02	.4538
33. Reading group demands	2.09	.80	.1146	<.01	.4675
34. Enthusiasm of students	2.29	.73	.0126	ns	.1548
35. Teacher determination to follow through when necessary	2.32	.67	.0192	ns	.1914
36. Teacher enjoyment	2.06	.79	.0168	ns	.1790
37. Length of reading turn	2.05	.90	.2154	<.01	.6408

Table 1-continued

Criterion Variable	Mean[1]	SD	Differences in R^2	p	Beta[2]
Reading Group Information Variables					
38. Reading group level completed at end-of-year	2.85	1.00	.4240	<.001	.8991
39. Size of reading group	8.03	2.41	.0000	ns	-.0069

[1]Means were calculated for reading groups within each class and then averaged across classes. Standard deviations of reading group means were also computed for each class and then these standard deviations were averaged across classes.

[2]Beta refers to the standard partial regression coefficient for the group mean on the pretest. This coefficient indicates how many units the criterion increases for every unit increase in the pretest, with the effect of class membership held constant. The sign on this coefficient indicates the direction of the relationship.

Table 2

Prediction of Group Achievement from Classroom Behaviors

Behaviors	Mean[1]	SD	Difference in R^2 Interaction	p	Difference in R^2 Main Effect	p	Beta[2]
1. Total response opportunities per minute	.31	.12	.0017	ns	.0004	ns	-.0901
2. Teacher selection of students based on ordered turns	.53	.07	.0057	ns	.0136	ns	.7600
3. Teacher selection of students prior to asking a question	.09	.02	.0101	ns	.0025	ns	.2651
4. Teacher selection of nonvolunteers	.18	.03	.0024	ns	.0154	.05	-.5651
5. Teacher selection of volunteers	.14	.03	.0023	ns	.0065	ns	-.3443
6. Student call outs in response to a teacher question	.06	.02	.0017	ns	.0010	ns	-.0584
7. Response opportunities that were reading questions	.68	.06	.0084	ns	.0006	ns	-.0703
8. Response opportunities that were nonreading questions	.30	.06	.0088	ns	.0009	ns	.0825

Table 2-continued

Behaviors	Mean[1]	SD	Difference in R^2 Interaction	p	Difference in R^2 Main Effect	p	Beta[2]
9. Response opportunities with correct answers	.72	.06	.0001	ns	.0201	.02	.2442
10. Response opportunities with incorrect answers	.21	.05	.0001	ns	.0102	ns	-.1750
11. Response opportunities with don't know answers	.01	.01	.0075	ns	.0007	ns	-.0430
12. Response opportunities with no response answers	.12	.03	.0011	ns	.0169	.04	-.2575
13. Correct answers with no feedback	.08	.04	.0007	ns	.0002	ns	-.0256
14. Correct answers with emphasis feedback	.36	.07	.0043	ns	.0000	ns	-.0096
15. Correct answers with praise feedback	.10	.05	.0083	ns	.0005	ns	-.0413
16. Correct answers with new question feedback	.19	.06	.0117	ns	.0009	ns	-.0358
17. Incorrect answers with criticism feedback	.02	.02	.0135	ns	.0002	ns	.0188
18. Incorrect answers with terminating feedback	.50	.06	.0012	ns	.0001	ns	-.0198

Table 2-continued

Behaviors	Mean[1]	SD	Difference in R^2 Interaction	p	Difference in R^2 Main Effect	p	Beta[2]
19. Total incorrect answers with sustaining feedback	.46	.06	.0004	ns	.0017	ns	-.0901
20. Incorrect answers with give answer feedback	.35	.14	.0070	ns	.0097	ns	-.2343
21. Incorrect answers with clue feedback	.24	.12	.0208	.02	.0208	ns	-.0388
22. No response answers with give answer feedback	.33	.18	.0096	ns	.0311	<.01	-.3212
23. No response answers with clue feedback	.30	.15	.0079	ns	.0000	ns	.0106
24. Total incorrect answers with improvement	.34	.12	.0014	ns	.0000	ns	.0124
25. Total no response answers with improvement	.33	.15	.0092	ns	.0037	ns	.1301

Table 2-continued

[1]Means were calculated for reading groups within each class and then averaged across classes. Standard deviations of reading group means were also computed for each class and then these standard deviations were averaged across classes.

[2]Beta refers to the standard partial regression coefficient for the teacher behavior. This coefficient indicates how many units the criterion increases for every unit increase in the teacher behavior, with the effect of all variables in the equation held constant. The sign on this coefficient indicates the direction of the relationship.